<110> KAKKIS, EMIL D.

<120> METHODS FOR TREATING DISEASES CAUSED BY DEFICIENCIES OF
      RECOMBINANT ALPHA-L-IDURONDINASE

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<140> TO BE ASSIGNED
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<150> 09/711,205
<151> 2000-11-09

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cgt ccc ctg cgc ccc cgc gcc gcg ctg ctg gcg ctc ctg gcc tcg ctc      1608
Arg Pro Leu Arg Pro Arg Ala Ala Leu Leu Ala Leu Leu Ala Ser Leu
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ctg gcc gcg ccc ccg gtg gcc ccg gcc gag gcc ccg cac ctg gtg cat      1656
Leu Ala Ala Pro Pro Val Ala Pro Ala Glu Ala Pro His Leu Val His
            20                  25                  30

gtg gac gcg gcc cgc gcg ctg tgg ccc ctg cgg cgc ttc tgg agg agc      1704
Val Asp Ala Ala Arg Ala Leu Trp Pro Leu Arg Arg Phe Trp Arg Ser
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aca ggc ttc tgc ccc ccg ctg cca cac agc cag gct gac cag tac gtg      1752
Thr Gly Phe Cys Pro Pro Leu Pro His Ser Gln Ala Asp Gln Tyr Val
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ctc agc tgg gac cag cag ctc aac ctc gcc tat gtg ggc gcc gtc cct      1800
Leu Ser Trp Asp Gln Gln Leu Asn Leu Ala Tyr Val Gly Ala Val Pro
            70                  75                  80

cac cgc ggc atc aag cag gtc cgg acc cac tgg ctg ctg gag ctt gtc      1848
His Arg Gly Ile Lys Gln Val Arg Thr His Trp Leu Leu Glu Leu Val
                85                  90                  95

acc acc agg ggg tcc act gga cgg ggc ctg agc tac aac ttc acc cac      1896
Thr Thr Arg Gly Ser Thr Gly Arg Gly Leu Ser Tyr Asn Phe Thr His
            100                 105                 110

ctg gac ggg tac ctg gac ctt ctc agg gag aac cag ctc ggg ttt gag      1944
Leu Asp Gly Tyr Leu Asp Leu Leu Arg Glu Asn Gln Leu Gly Phe Glu
        115                 120                 125

ctg atg ggc agc gcc tcg ggc cac ttc act gac ttt gag gac aag cag      1992
Leu Met Gly Ser Ala Ser Gly His Phe Thr Asp Phe Glu Asp Lys Gln
130                 135                 140                 145

cag gtg ttt gag tgg aag gac ttg gtc tcc agc ctg gcc agg aga tac      2040
Gln Val Phe Glu Trp Lys Asp Leu Val Ser Ser Leu Ala Arg Arg Tyr
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atc ggt agg tac gga ctg gcg cat gtt tcc aag tgg aac ttc gag acg      2088
Ile Gly Arg Tyr Gly Leu Ala His Val Ser Lys Trp Asn Phe Glu Thr
            165                 170                 175

tgg aat gag cca gac cac cac gac ttt gac aac gtc tcc atg acc atg      2136
Trp Asn Glu Pro Asp His His Asp Phe Asp Asn Val Ser Met Thr Met
            180                 185                 190

caa ggc ttc ctg aac tac tac gat gcc tgc tcg gag ggt ctg cgc gcc      2184
Gln Gly Phe Leu Asn Tyr Tyr Asp Ala Cys Ser Glu Gly Leu Arg Ala
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gcc agc ccc gcc ctg cgg ctg gga ggc ccc ggc gac tcc ttc cac acc      2232
Ala Ser Pro Ala Leu Arg Leu Gly Gly Pro Gly Asp Ser Phe His Thr
210                 215                 220                 225

cca ccg cga tcc ccg ctg agc tgg ggc ctc ctg cgc cac tgc cac gac      2280
Pro Pro Arg Ser Pro Leu Ser Trp Gly Leu Leu Arg His Cys His Asp
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ggt acc aac ttc ttc act ggg gag gcg ggc gtg cgg ctg gac tac atc    2328
Gly Thr Asn Phe Phe Thr Gly Glu Ala Gly Val Arg Leu Asp Tyr Ile
            245             250                 255

tcc ctc cac agg aag ggt gcg cgc agc tcc atc tcc atc ctg gag cag    2376
Ser Leu His Arg Lys Gly Ala Arg Ser Ser Ile Ser Ile Leu Glu Gln
        260                 265                 270

gag aag gtc gtc gcg cag cag atc cgg cag ctc ttc ccc aag ttc gcg    2424
Glu Lys Val Val Ala Gln Gln Ile Arg Gln Leu Phe Pro Lys Phe Ala
    275                 280                 285

gac acc ccc att tac aac gac gag gcg gac ccg ctg gtg ggc tgg tcc    2472
Asp Thr Pro Ile Tyr Asn Asp Glu Ala Asp Pro Leu Val Gly Trp Ser
290                 295                 300                 305

ctg cca cag ccg tgg agg gcg gac gtg acc tac gcg gcc atg gtg gtg    2520
Leu Pro Gln Pro Trp Arg Ala Asp Val Thr Tyr Ala Ala Met Val Val
            310                 315                 320

aag gtc atc gcg cag cat cag aac ctg cta ctg gcc aac acc acc tcc    2568
Lys Val Ile Ala Gln His Gln Asn Leu Leu Leu Ala Asn Thr Thr Ser
            325                 330                 335

gcc ttc ccc tac gcg ctc ctg agc aac gac aat gcc ttc ctg agc tac    2616
Ala Phe Pro Tyr Ala Leu Leu Ser Asn Asp Asn Ala Phe Leu Ser Tyr
        340                 345                 350

cac ccg cac ccc ttc gcg cag cgc acg ctc acc gcg cgc ttc cag gtc    2664
His Pro His Pro Phe Ala Gln Arg Thr Leu Thr Ala Arg Phe Gln Val
        355                 360                 365

aac aac acc cgc ccg ccg cac gtg cag ctg ttg cgc aag ccg gtg ctc    2712
Asn Asn Thr Arg Pro Pro His Val Gln Leu Leu Arg Lys Pro Val Leu
370                 375                 380                 385

acg gcc atg ggg ctg ctg gcg ctg ctg gat gag gag cag ctc tgg gcc    2760
Thr Ala Met Gly Leu Leu Ala Leu Leu Asp Glu Glu Gln Leu Trp Ala
            390                 395                 400

gaa gtg tcg cag gcc ggg acc gtc ctg gac agc aac cac acg gtg ggc    2808
Glu Val Ser Gln Ala Gly Thr Val Leu Asp Ser Asn His Thr Val Gly
            405                 410                 415

gtc ctg gcc agc gcc cac cgc ccc cag ggc ccg gcc gac gcc tgg cgc    2856
Val Leu Ala Ser Ala His Arg Pro Gln Gly Pro Ala Asp Ala Trp Arg
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gcc gcg gtg ctg atc tac gcg agc gac gac acc cgc gcc cac ccc aac    2904
Ala Ala Val Leu Ile Tyr Ala Ser Asp Asp Thr Arg Ala His Pro Asn
        435                 440                 445

cgc agc gtc gcg gtg acc ctg cgg ctg cgc ggg gtg ccc ccc ggc ccg    2952
Arg Ser Val Ala Val Thr Leu Arg Leu Arg Gly Val Pro Pro Gly Pro
450                 455                 460                 465

ggc ctg gtc tac gtc acg acg cgc tac ctg gac aac ggg ctc tgc agc ccc 3000
Gly Leu Val Tyr Val Thr Thr Arg Tyr Leu Asp Asn Gly Leu Cys Ser Pro
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gac ggc gag tgg cgg cgc ctg ggc cgg ccc gtc ttc ccc acg gca gag    3048
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- 44 -

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cag ttc cgg cgc tag cgc gcg gct gag gac ccg gtg gcc gcg gcg ccc      3096
Gln Phe Arg Arg  *  Arg Ala Ala Glu Asp Pro Val Ala Ala Ala Pro
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cgc ccc tta ccc gcc ggc ggc cgc ctg agg ctg cgc ccc gcg ctg cgg      3144
Arg Pro Leu Pro Ala Gly Gly Arg Leu Arg Leu Arg Pro Ala Leu Arg
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ctg ccg tcg ctt ttg ctg gtg cac gtg tgt gcg cgc ccc gag aag ccg      3192
Leu Pro Ser Leu Leu Leu Val His Val Cys Ala Arg Pro Glu Lys Pro
            530                     535                     540

ccc ggg cag gtc acg cgg ctc cgc gcc ctg ccc ctg acc caa ggg cag      3240
Pro Gly Gln Val Thr Arg Leu Arg Ala Leu Pro Leu Thr Gln Gly Gln
545                     550                     555                 560

ctg gtt ctg gtc tgg tcg gat gaa cac gtg ggc tcc aag tgc ctg tgg      3288
Leu Val Leu Val Trp Ser Asp Glu His Val Gly Ser Lys Cys Leu Trp
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aca tac gag atc cag ttc tct cag gac ggt aag gcg tac acc ccg gtc      3336
Thr Tyr Glu Ile Gln Phe Ser Gln Asp Gly Lys Ala Tyr Thr Pro Val
                580                     585                     590

agc agg aag cca tcg acc ttc aac ctc ttt gtg ttc agc cca gac aca      3384
Ser Arg Lys Pro Ser Thr Phe Asn Leu Phe Val Phe Ser Pro Asp Thr
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ggt gct gtc tct ggc tcc tac cga gtt cga gcc ctg gac tac tgg gcc      3432
Gly Ala Val Ser Gly Ser Tyr Arg Val Arg Ala Leu Asp Tyr Trp Ala
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cga cca ggc ccc ttc tcg gac cct gtg ccg tac ctg gag gtc cct gtg      3480
Arg Pro Gly Pro Phe Ser Asp Pro Val Pro Tyr Leu Glu Val Pro Val
625                     630                     635                 640

cca aga ggg ccc cca tcc ccg ggc aat cca tgagcctgtg ctgagcccca        3530
Pro Arg Gly Pro Pro Ser Pro Gly Asn Pro
                    645                     650

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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaag aattcctgca    3710
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- 45 -

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                20                  25                  30
His Val Asp Ala Ala Arg Ala Leu Trp Pro Leu Arg Arg Phe Trp Arg
        35                  40                  45
Ser Thr Gly Phe Cys Pro Pro Leu Pro His Ser Gln Ala Asp Gln Tyr
    50                  55                  60
Val Leu Ser Trp Asp Gln Gln Leu Asn Leu Ala Tyr Val Gly Ala Val
65                  70                  75                  80
Pro His Arg Gly Ile Lys Gln Val Arg Thr His Trp Leu Leu Glu Leu
                85                  90                  95
Val Thr Thr Arg Gly Ser Thr Gly Arg Gly Leu Ser Tyr Asn Phe Thr
                100                 105                 110
His Leu Asp Gly Tyr Leu Asp Leu Leu Arg Glu Asn Gln Leu Gly Phe
        115                 120                 125
Glu Leu Met Gly Ser Ala Ser Gly His Phe Thr Asp Phe Glu Asp Lys
    130                 135                 140
Gln Gln Val Phe Glu Trp Lys Asp Leu Val Ser Ser Leu Ala Arg Arg
145                 150                 155                 160
Tyr Ile Gly Arg Tyr Gly Leu Ala His Val Ser Lys Trp Asn Phe Glu
                165                 170                 175
Thr Trp Asn Glu Pro Asp His His Asp Phe Asp Asn Val Ser Met Thr
                180                 185                 190
Met Gln Gly Phe Leu Asn Tyr Tyr Asp Ala Cys Ser Glu Gly Leu Arg
        195                 200                 205
Ala Ala Ser Pro Ala Leu Arg Leu Gly Gly Pro Gly Asp Ser Phe His
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- 46 -

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Thr Pro Arg Ser Pro Leu Ser Trp Gly Leu Leu Arg His Cys His
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              245                   250                   255
Ile Ser Leu His Arg Lys Gly Ala Arg Ser Ser Ile Ser Ile Leu Glu
              260                   265                   270
Gln Glu Lys Val Val Ala Gln Gln Ile Arg Gln Leu Phe Pro Lys Phe
         275                   280                   285
Ala Asp Thr Pro Ile Tyr Asn Asp Glu Ala Asp Pro Leu Val Gly Trp
         290                   295                   300
Ser Leu Pro Gln Pro Trp Arg Ala Asp Val Thr Tyr Ala Ala Met Val
305                   310                   315                   320
Val Lys Val Ile Ala Gln His Gln Asn Leu Leu Leu Ala Asn Thr Thr
              325                   330                   335
Ser Ala Phe Pro Tyr Ala Leu Leu Ser Asn Asp Asn Ala Phe Leu Ser
         340                   345                   350
Tyr His Pro His Pro Phe Ala Gln Arg Thr Leu Thr Ala Arg Phe Gln
         355                   360                   365
Val Asn Asn Thr Arg Pro Pro His Val Gln Leu Leu Arg Lys Pro Val
         370                   375                   380
Leu Thr Ala Met Gly Leu Leu Ala Leu Leu Asp Glu Glu Gln Leu Trp
385                   390                   395                   400
Ala Glu Val Ser Gln Ala Gly Thr Val Asp Ser Asn His Ile Thr Val
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Gly Val Leu Ala Ser Ala His Arg Pro Gln Gly Pro Ala Asp Ala Trp
              420                   425                   430
Arg Ala Ala Val Leu Ile Tyr Ala Ser Asp Asp Thr Arg Ala His Pro
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Asn Arg Ser Val Ala Val Thr Leu Arg Leu Arg Gly Val Pro Pro Gly
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Pro Gly Leu Val Tyr Val Thr Arg Tyr Leu Asp Asn Gly Leu Cys Ser
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Pro Asp Gly Glu Trp Arg Arg Leu Gly Arg Pro Val Phe Pro Thr Ala
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Glu Gln Phe Arg Arg Arg Ala Ala Glu Asp Pro Val Ala Ala Ala Pro
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Arg Pro Leu Pro Ala Gly Gly Arg Leu Arg Leu Arg Pro Ala Leu Arg
         515                   520                   525
Leu Pro Ser Leu Leu Leu Val His Val Cys Ala Arg Pro Glu Lys Pro
         530                   535                   540
Pro Gly Gln Val Thr Arg Leu Arg Ala Leu Pro Leu Thr Gln Gly Gln
545                   550                   555                   560
Leu Val Leu Val Trp Ser Asp Glu His Val Gly Ser Lys Cys Leu Trp
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Thr Tyr Glu Ile Gln Phe Ser Gln Asp Gly Lys Ala Tyr Thr Pro Val
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Ser Arg Lys Pro Ser Thr Phe Asn Leu Phe Val Phe Ser Pro Asp Thr
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Gly Ala Val Ser Gly Ser Tyr Arg Val Arg Ala Leu Asp Tyr Trp Ala
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Arg Pro Gly Pro Phe Ser Asp Pro Val Pro Tyr Leu Glu Val Pro Val
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Pro Arg Gly Pro Pro Ser Pro Gly Asn Pro
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- 47 -